

1 18. (amended) Apparatus for well drilling comprising a mud motor having a bit box,
2 a bearing mandrel and a coupler disposed therebetween, said coupler comprising a through
3 bore substantially along a longitudinal axis of the coupler, said coupler having an interior
4 surface and an exterior surface, and a receiving pocket in the exterior surface shaped to
5 receive a sonde.

REMARKS

Applicants' counsel thanks the Examiner for her very careful and thorough examination of the present application. The claims have been amended to more clearly describe the invention. No new matter has been entered. The title has been amended to correct a typographical error.

The Examiner has rejected claims 9, 14, 18 and 20 as being anticipated by Moake under 35 USC § 102. With regard to claims 9, 14 and 18, these claims originally all recited a "tubular outer housing of a mud motor" in the preamble. These claims have all now been amended to affirmatively recite the "mud motor having a tubular outer housing" in the body of the claim, thereby forming a substantive patentable limitation in each of these claims.

Thus, claim 9 now affirmatively recites an apparatus comprising a mud motor where a pocket sized to receive a sonde is provided in the exterior surface of the outer housing of the mud motor. Conversely, Moake neither discloses nor suggests such an arrangement.

Referring to col. 5, lines 23-48, the assembly disclosed in Moake (Figs. 1-3) does not include a sonde or a pocket for receiving a sonde in the housing of a mud motor. Rather, the illustrated bottom hole assembly (BHA) includes a "logging-while-drilling" (LWD) tool; but it is particularly recited in Moake (col. 5 lines 45-48) that "[a]s an alternative to driving the drillstring from the surface, a downhole motor, or "mud motor" as it is commonly called in the art, may be employed."

Thus, the apparatus of Moake does not disclose providing a sonde or a pocket for a sonde in the tubular outer housing of a mud motor because the use of a mud motor is considered and described only as an "alternate embodiment" for which no description is provided. Nowhere in Moake is it disclosed or suggested how a sonde might or would be positioned or oriented relative to a mud motor if one were included. Certainly, there is no description or suggestion to provide the sonde (or a pocket for a sonde) in the outer housing of the mud motor itself.

The disclosed and claimed apparatus of the present invention is an improvement over

the prior art at least because it permits the use of a mud motor, eliminating the need to turn the entire drill string from the surface in order to drive the drill bit, while simultaneously positioning the sonde as near as possible to the drill bit for accurate position and orientation measurements, located *in the mud motor*.

Claim 9 has also been rejected under 35 USC § 102 as being anticipated by Morris et al. (Morris). Like Moake above, Morris does not disclose using a mud motor to drive the drill bit in conjunction with providing a sonde in close proximity to the drill bit, and particularly not within the mud motor itself. In fact, Morris does not even contemplate using a mud motor. Rather, Morris discloses an offset transmitter housing (4) having a cavity to accommodate the drive shaft (2) (in cavity 18) and a compartment for a transmitter (5). Though the drive shaft (2) is provided with a fluid passageway (17) which carries a pressurized drilling fluid, the drilling fluid is only used in Morris to “cool, lubricate, and flush the bearings, and to...remove[] cuttings from the area of the drive shaft 2, clutch 6 and bearings 9.” Morris, col. 4 lines 41-49. The drilling fluid also flows past the stabilizing fins (13) of the drilling apparatus “to provide a medium...to maintain the offset transmitter housing 4 in a stable position” in a bore hole being drilled. Morris, col. 4 line 64 through col. 5. There is no suggestion or teaching in Morris that the drilling fluid is used to operate the drill bit, and consequently no suggestion or teaching to employ a mud motor. Certainly, Morris is silent as to the presence *in the mud motor housing itself* of a sonde or a pocket for a sonde.

In view of the above, it is respectfully submitted that the rejections of claim 9 have been overcome, and that claim 9 is now in condition for allowance.

Like claim 9, claim 14 also positively recites a mud motor having a tubular outer housing, together with a mount for a sonde being provided in the outer housing within the exterior diameter thereof. With respect to claim 18, that claim recites a particular structure for the mud motor, ‘having a bit box, a bearing mandrel and a coupler disposed therebetween..., said coupler having an interior surface and an exterior surface, and a receiving pocket in the exterior surface shaped to receive a sonde.’ It is respectfully submitted that claims 14 and 18 should also now be allowable for the same reasons outlined above with respect to claim 9.

Claim 20 recites a an improvement in an “entrenching powering device,” which is disclosed in the specification as a term used interchangeably with “mud motor” to refer to a device “used to rotate a boring device, without turning the drill pipe/drill string....” See

specification, page 1 line 28 to page 2 line 1. Accordingly, it is respectfully submitted that claim 20 should also be allowable for the same reasons as described above.

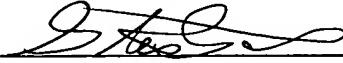
Claim 17 has been rejected under 35 USC § 102 as being anticipated by Morris. Like claim 18 described above, claim 17 recites a particular structure for the mud motor, having a "tubular outer housing having a through bore substantially along a longitudinal axis thereof, an interior surface and an exterior surface, said tubular outer housing comprising a collar having an interior surface and an exterior surface removably attached at the inner surface of the collar to the outer surface of the tubular outer housing, a receiving pocket in the exterior surface of the collar shaped to receive a sonde." Morris is absolutely silent as to the use or structure of a mud motor, and provides no teaching or suggestion to provide a sonde therein. Accordingly, claim 17 is also allowable over the cited references.

In view of all of the above, it is respectfully submitted that claims 9, 14, 17, 18 and 20 are now all allowable over the cited references. All remaining claims are dependent claims, and are thus also believed allowable by virtue of their dependency on an allowable independent claim. Accordingly, all claims now being in condition for allowance, notice to that effect is respectfully requested.

Applicants note that an Information Disclosure Statement was filed together with this divisional application, enclosing two pages of PTO FORM-1449 listing references for consideration by the Examiner. Applicants have not yet received the initialed copies of these forms indicating the Examiner has considered the listed references. Therefore, Applicants respectfully request that the Examiner enclose initialed copies of these FORM-1449 pages with her next communication to Applicants.

If any fees are required by this communication not covered by an enclosed check, please charge any such fees to our Deposit Account No. 16-1820, Order No. 32237US2.

Respectfully submitted,
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Date: March 25, 2003



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IN THE TITLE:

Please amend the title to read as follows:

~~INTEGRATED INTEGRATED~~ TRANSMITTER SURVEYING WHILE BORING
ENTRENCHING POWERING DEVICE FOR THE CONTINUATION OF A GUIDED BORE
HOLE

IN THE CLAIMS:

Please amend claims 9-15 and 17-18 to read as follows.

9. (amended) ~~A tubular outer housing of An apparatus comprising a mud motor having a tubular outer housing~~, said tubular outer housing having a through bore substantially along a longitudinal axis thereof and an interior surface and an exterior surface, said tubular outer housing of said mud motor comprising a receiving pocket in the exterior surface sized to receive a sonde.

10. (amended) ~~The tubular outer housing Apparatus~~ of claim 9, further comprising a shock resistant holder for the sonde shaped to be received in the receiving pocket, and a cover plate, removably attached to the outer housing over the receiving pocket, functioning to hold the sonde and shock resistant holder in place.

11. (amended) ~~The tubular outer housing Apparatus~~ of claim 10, further comprising a sonde placed in the shock resistant holder.

12. (amended) ~~The tubular outer housing Apparatus~~ of claim 10, wherein the cover plate further includes at least one longitudinal slot to allow the passage of electromagnetic signals from the sonde.

13. (amended) ~~The tubular outer housing Apparatus~~ of claim 12, wherein the longitudinal slots further include a filling of non-metallic material.



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14. (amended) A tubular outer housing for Apparatus comprising a mud motor having a tubular outer housing, said tubular outer housing having an exterior diameter, said tubular housing further including a mount for a sonde within the external exterior diameter.

15. (amended) The tubular outer housing Apparatus of claim 14, wherein the mount comprises an elastomeric sarcophagus shaped to hold a said sonde, a cavity in the tubular outer housing shaped to hold the elastomeric sarcophagus, a lip formed around the cavity, and a removable cover plate set in the lip.

17. (amended) A tubular outer housing of Apparatus comprising a mud motor having a tubular outer housing, said tubular outer housing having a through bore substantially along a longitudinal axis thereof, an interior surface and an exterior surface, said tubular outer housing comprising a collar having an interior surface and an exterior surface removably attached at the inner surface of the collar to the outer surface of the tubular outer housing, a receiving pocket in the exterior surface of the collar shaped to receive a sonde, a shock resistant holder for the sonde shaped to set in the receiving pocket, and a cover plate, removably attached to the outer housing collar over the receiving pocket, functioning to hold the sonde and shock resistant holder in place.

18. (amended) Apparatus for well drilling comprising a mud motor having a bit box, a bearing mandrel and a coupler disposed therebetween. A coupler disposed between a bearing mandrel and a bit box of a mud motor, said coupler comprising a through bore substantially along a longitudinal axis of the coupler, said coupler having an interior surface and an exterior surface, and a receiving pocket in the exterior surface shaped to receive a sonde.